Administrative Standard Operating Procedure (SOP)

Technical and Administrative Review of Sufficient Credible Data/Beneficial Use Support Determinations

Montana Department of Environmental Quality
Water Quality Planning Bureau

Approvals:

George Mathieus, Bureau Chief — Date

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Prepared by: Mark Bostrom, QA Officer — Date

Table of Contents

List of Attachments:

1. Background -Water Quality Assessment

Water quality assessments made using bureau SOP WQPBWQM-001, Water Quality Assessment Process and Methods, must be reviewed prior to entry in the EPA's Assessment Database (ADB) to assure that all information required for a valid entry are included in the assessment documentation. In addition, a randomly chosen 10% of all assessments must undergo a technical review by a member of the bureau's management staff, or technically qualified peer, to assure that the Water Quality Assessment Process was followed and that basis for the assessment outcome is scientifically sound.

1.1. Identification of Readily Available Data

Existing and readily available data for the waterbody is identified, and catalogued in a reference section of the assessment record. Cataloging references is necessary because most water quality studies deal with more than one waterbody and the inclusion of each (complete) report in a file would become voluminous. In addition, a great deal of water quality data available today is contained in electronic databases, which cannot be efficiently presented in hardcopy format. The complete list of references represents the existing and readily available data for the waterbody and serves as the basis for the water quality assessment. Any information included in the reference section that will not be considered in the water quality assessment is noted at the end of the section along with a justification for its exclusion (40 CFR Part 130.7(b)(6)(iii)).

1.2. Data Quality Assessment

The level of data that is existing and readily available for the waterbody is reviewed to determine its rigor and applicability for the decisions at hand. In Montana Code, this is deemed Sufficient Credible Data (Montana Water Quality Act 75-5-702(2)). To measure scientific rigor, the entire body of available data is segregated by data type (Biology, Physical/Habitat, and Chemistry/Toxicological). Each data *type* is then reviewed for components of scientific rigor including: technical components, spatial/temporal coverage, data quality, and data currency. Component rigor is determined by checking off boxes corresponding to standard descriptions of a particular component's rigor. An ordinal scale running from 1 (poor) to 4 (excellent) is correlated to the component rigor description selected. This process is repeated for each component.

A sufficient credible data score is determined for the *data type* when all components are checked off and the assessor can generally view which ordinal score best describes the data set (considering all components). This is not simply the average of all components, but considers if one component provides a limiting factor for the data set.

This data quality assessment is performed for *each* data type and the sum of all data types calculated to arrive at a sufficient credible data score for the entire body of data. The level of data for all types required to meet "sufficient credible data" for an aquatic life/fisheries beneficial use support determination is a sum score of 6. This is the minimum data rigor required to proceed with a beneficial use support determination, *with one exception*. If within the body of data, there is an overwhelming indication of an extreme condition, (e.g., either extremely degraded or extremely pristine) the beneficial use support determination may proceed for the specific condition observed and its corresponding beneficial uses.

1.3. Beneficial Use Support Determination

Once it has been determined that there are sufficient credible data to evaluate a waterbody, the assessment process moves to determining the level of beneficial use support required for each use of that waterbody by the Montana Water-Use Classifications.

DEQ conducts beneficial use-support determinations (BUDs) in order to document which state waterbodies are impaired due to man-caused impacts to water quality. Beneficial use-support determinations are made for the following beneficial uses:

- Aquatic Life (considers all life forms which make up and depend on the aquatic ecosystem)
- Cold Water Fishery **or** Warm Water Fishery
- Drinking Water Supply (protects culinary and food-processing use)
- Recreation and Aesthetics (bathing, swimming, boating, fishing, etc.)
- Agriculture Supply
- Industry Supply

For each beneficial use, a determination is made describing the status of the waterbody. These status's are:

- Full support
- Partial support
- Non-support
- Threatened

A waterbody is considered to be "fully supporting" its beneficial uses when the water quality standards established to protect those uses are met. When one or more beneficial uses are not fully supported due to human activities the waterbody may be rated as either "not supporting" or "partially supporting" the affected use or uses. A "threatened" rating indicates that there is evidence that one or more fully supported uses may soon be impaired.

Only those categories that apply to the beneficial uses specified for each water-use classification are evaluated for the waters in that classification. For example, a waterbody classified C-1 would not be assessed for use support of drinking water supply or warm water fishery since those uses are not expected for C-1 class waters.

EPA considers fish consumption to be a beneficial use but Montana law does not recognize this use. Therefore, DEQ considers fish consumption when making aquatic life and fisheries, and recreation and aesthetics beneficial use-support determinations for impairment listing purposes.

1.3.1. Threatened Uses

Montana water quality law (75-5-103 MCA) defines the term "threatened waterbody".

> A waterbody or stream segment for which sufficient credible data and calculated increases in loads show that the waterbody or stream segment is fully supporting its designated uses but threatened for a particular designated use because of:
> (a) Proposed sources that are not subject to pollution prevention or control actions required by a discharge permit, the nondegradation provisions, or reasonable land, soil, and water conservation practices; or
> (b) Documented adverse pollution trends.

DEQ has not developed decision tables to determine if specific uses are threatened. Instead, DEQ considers that a beneficial use may be threatened if:

- Data show a decline in the conditions supporting the beneficial use, listed in the beneficial use support decision table or
- Activities proposed for the watershed would be sources of pollution that are not subject to pollution prevention or control actions required by a discharge permit or
- Activities for which a permit is required are occurring within the watershed without a permit or;
- Reasonable land soil and water conversation practices are not being implemented.

A DEQ reviewer assigning a determination of "threatened" to a waterbody beneficial use is required to identify the information used and rationale for making this determination.

1.3.2. Aquatic Life and Fisheries Beneficial Use Support Determination

The broad range of factors that must be considered in assessing support for the aquatic life/fisheries uses make the assessment of support for these uses more complex than the assessment of support for other uses. Depending on the type and amount of information available, DEQ has developed two distinct tests, which may be employed to make aquatic life/fisheries support decisions.

1.3.2.1. Weight of Evidence Test

The weight-of-evidence test is a process for making aquatic life use support decisions when there is a high level of information. DEQ uses this if there are sufficient and credible data in all three of the data categories and if two or more biological assemblages were assessed (minimum score = 3). The assemblages employed must be adequate to reflect any probable impairment. Conclusions drawn from each data category are combined using the weight-of-evidence test to produce the final aquatic life use-support determination employing the following guidelines in combination with Beneficial Use-Support Decision Tables 9 and 10.

- **Fully Supporting** requires all data categories to indicate the waterbody is unimpaired or least impaired, or no more than one data category (i.e. physical/habitat biology or chemistry/toxicity) indicate moderate impairment; **OR** no more than one biological assemblage indicates moderate impairment (the biological community that indicates impairment must be at least 50% of reference condition).

- **Partially Supporting** requires two or more data categories indicating moderate impairment or one data category indicating severe impairment (i.e. physical/habitat biology or chemistry/toxicity) with the remaining data categories indicating that the waterbody is unimpaired or least impaired; **OR** two biological assemblages indicating moderate impairment; or one biological assemblage indicating less than 50% of reference condition.

- **Not Supporting** requires one or more data categories indicating moderate impairment in combination with a separate category indicating severe impairment; **OR** two biological assemblages indicating less than 50% of reference condition.

1.3.2.2. Independent Evidence

The independent-evidence test is a decision process DEQ uses to make aquatic life use-support determinations if only one or two of the data categories are used (physical/habitat biology or chemical/toxicity); or if all three categories are used but only one biological assemblage (e.g. fish) was assessed or the biological data category's score was < 3.

The independent-evidence test is used when a full suite of data is not available but what is available provides a basis for making an aquatic life use-support determination. For example data indicating that a stream segment experiences frequent dewatering may be an adequate basis for determining that the aquatic life/fisheries beneficial use is impaired. The factors listed in Tables 9 and 10 are directly applied to interpret the use support of each beneficial use. If all available data indicate that a waterbody is "unimpaired/least impaired" then the beneficial use-support determination would be fully supporting. Data indicating that a beneficial use is "moderately impaired" would result in the waterbody being listed as partially supporting, while data indicating that a beneficial use is "severely impaired" would result in the waterbody being listed as not supporting the beneficial use being evaluated.

1.3.3. Beneficial Use Support Determination - Other Uses

Reaching beneficial use support determination for the drinking water, recreation and aesthetics, agriculture supply and industrial supply uses is a relatively straightforward process. For these uses, criteria based on the relevant water quality standards are listed in Tables 11, 12, 13, and 14. The available data for a waterbody are evaluated using the listed criteria, and an overall use support assignment is made based on consideration of all the criteria for which relevant data are available. In some situations, the overall rating will result from clear evidence of support or impairment associated with one or two criteria; other determinations may be derived from indications of water quality derived from the entire set of criteria that apply to a particular use.

1.3.4. Petitions

Under Montana law, any person can petition DEQ to change any beneficial use support decision by providing the data necessary to support the requested change (75-5-702 MCA). For example a petition to reconsider a DEQ partial support determination for aquatic life could be based on data from multiple biological assemblages (i.e. fish, macroinvertebrates, algae) which clearly demonstrate that aquatic life is not impacted by any of the listed probable causes and sources of impairment. DEQ beneficial use-support determinations also could be appealed by providing data that clearly demonstrates that the causes of impairment are due to naturally occurring conditions.

When DEQ receives a petition, it conducts a sufficient credible data assessment. All available data including both the data used to make the original determination and those provided with the petition are reviewed to ensure that there are sufficient credible data to provide a basis for a valid Beneficial Use Support Determination . Then the normal tests and table criteria are used to make a beneficial use-support determination. This process must be completed within 60 days of the petition submittal. If DEQ determines that the original determination should be revised, it must provide public notice of the proposed change and allow 60 days for public comment before taking final action.

2. Purpose

This SOP provides a mechanism for administrative and technical review of water quality assessments. This review is required to assure that environmental information destined for public record has been produced under a quality system as required by EPA Order 5360.1 A2.

3. Summary

Assessment records completed by the Water Quality Monitoring Section are submitted to the Data Management Section for entry into the Assessment Database (ADB). The ADB becomes the database required to be submitted with the Integrated Water Quality Report (IWQR).

All information submitted for ADB entry must be reviewed for completeness so that it will:

- Complete the ADB entry
- Meet the legal requirements for documentation

4. Applicability

This SOP defines a technical and administrative process used by the Montana Department of Environmental Quality's Water Quality Planning Bureau.

The technical and administrative procedures used to collect the information reviewed in this process are likely to evolve between reporting cycles. Therefore, this SOP must be reviewed annually to assess the impact of any legal, technical or information systems changes that may have occurred.

5. Definitions and Abbreviations

ADB - Assessment Database – EPA's database for water quality information.

ARM – Administrative Rules of Montana

BUD – Beneficial Use Support Determination – DEQ conducts beneficial use- support determinations in order to document which state water bodies are impaired due to anthropogenic impacts on water quality. Additional information regarding beneficial use support determinations is detailed in bureau SOP WQPBWQM-001.

Bureau – Water Quality Planning Bureau of the Montana Department of Environmental Quality

MDEQ – Montana Department of Environmental Quality

SCD – Sufficient Credible Data – Montana Law requires the use of sufficient and credible data to make beneficial use-support determinations. The law defines SCD as "chemical, physical or biological monitoring data alone or in combination with narrative information that supports a finding as to whether a waterbody is achieving compliance with applicable water quality standards" (75-5-103 MCA).

Water Quality Assessment – The process developed and shaped by legal mandates, water quality standards, the tools and techniques of water quality monitoring & assessment, the availability of

information, and the funds and administrative resources that can be devoted to assessment of water quality status. This process is used to first, determine the adequacy of all information available and second, guides the Beneficial Use Support Determination s.

Assessment Record – A MS Excel workbook that provides the user with a template for performing the water quality assessments. Once completed, these templates summarize the data relevant to the waterbody segment in an electronic file in the Water Quality Planning Bureau archive. Further, information concerning the data that is used to make the beneficial use support determination is categorized, referenced, and summarized to allow future data users to understand the basis behind the beneficial use support determination.

6. Personnel Qualifications/Responsibilities

The person(s) performing this SOP should have a collective understanding of the Federal Water Pollution Control Act [As Amended through P.L. 107-303, November 27, 2002], Montana Water Quality Standards [ARM 17.30.621-629 and ARM 17.30.635 – 646], Montana Water-Use Classification System [ARM 17.30.604 – 629] and any recent annotations to Montana Code related to water quality. A detailed understanding of SOP WQPBWQM-001 is *required*. A basic understanding of the use of computer hardware (PC), software, (MS Office, Assessment Database version 2.0, Environet, Novel Networks, Etc.) is necessary.

The staff publishing the biennial report is relied upon as the last step in a process that will determine a public record for the State of Montana. Therefore, the technical and administrative reviews described in this SOP are among the last reviews before the document is published.

7. Procedure

7.1. Administrative Review

The administrative review is a final verification by the assessor that the completed assessment contains all the necessary information for an ADB entry. To assist with this review, a checklist (Attachment 1) has been developed that must be filled out before submitting the assessment record to the integrated report coordinator.

Once a completed assessment has had its checklist filled out by the assessor, both the electronic and hardcopy files are forwarded to the monitoring section supervisor. The monitoring section supervisor records that the assessment is complete in a spreadsheet and makes a random selection (10% of assessments) for technical review.

Upon completion of all reviews, the electronic version of the assessment record is posted to K:\2006 Integrated WQ Report\2006_Assess_Updates\!Deposit_Rosie
The hardcopy of the assessment record is forwarded to the integrated report coordinator, who makes the ADB entry.

7.2. Technical Review

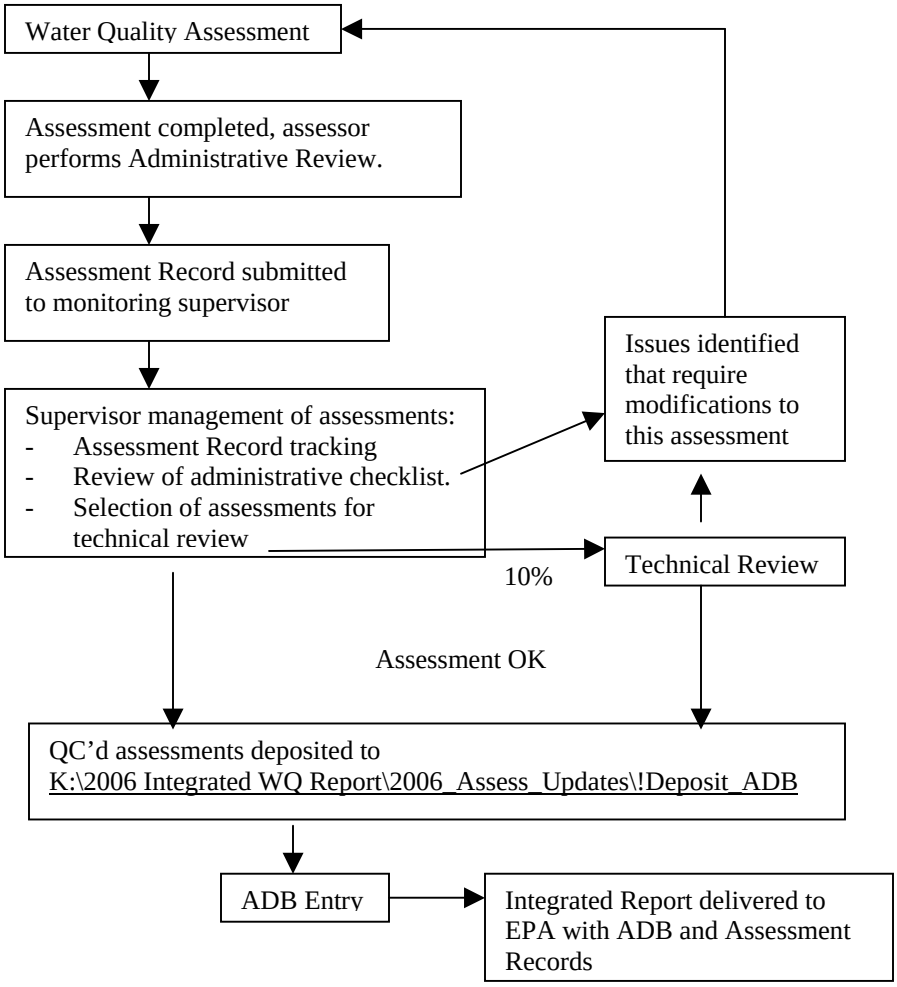
Technical review of assessment records will be conducted randomly on a minimum of 10% of the total number produced. The monitoring section supervisor is responsible for tracking the frequency and delivering the selected assessment records to the reviewer.

Technical assessment is essentially a peer review of staff work products. Because of this, it is important that the technical review focuses on the *process* and how it was followed rather

than focusing on individual decisions being right or wrong, recognizing that there are many "grey areas" in the water quality sciences.

Attachment 2 is a form for recording the technical review.

Flowchart of QC Reviews



8. Records Management & Security

Maintaining and controlling the records that support the decisions of the Bureau is essential to the defensibility of the decision in a court of law or under public scrutiny.

The goal is to preserve a permanent record of the assessment. The permanent record must contain all hardcopy files & reports that are referred to in the assessment record[1]. The hardcopy assessment records are controlled by the Bureau's Water Quality Laboratory Coordinator using a

[1] Some referenced material may not reside in the DEQ library. To provide a link to external documents, the DEQ library *database* must contain the location information regarding all references and entries.

simple check-out/check-in system. Assessment records that have undergone administrative review from this SOP will be considered complete when they are entered into the ADB. There are no provisions to remove or retire Assessment Record files at a specified interval. Therefore, they will remain as a permanent record and historical example of the Bureau's activity.

A copy of the original *electronic* assessment record is maintained by the data management section. A read only version of the original is made available for the bureau staff and public through the Environet site. The read only setting assures the integrity of the text, macros, and calculations in the file.

Once the electronic version of the assessment record has been verified to contain the same information as the hardcopy file, this information is used to populate the required fields in the ADB. Following ADB entry, the electronic version is saved to

K:\WATER QUALITY\303-305_Archives\1 - Integrated Reports\200X_IntegratedRpt\XXCycle_DR8Updates\.

This folder is protected to the level of read only for all users except the staff performing this review so that non-reviewed files cannot be placed in the directory.

Assessment Records that are not able to provide a complete ADB entry (for any reason) are returned to the monitoring section supervisor and placed in the network folder K:\2006 Integrated WQ Report\2006_Assess_Updates\Hold.

MDEQ's Novell network is secured from external access by password and a system of internal rights to access key directories. For more information regarding the security and policies of the Information system used by all MDEQ employees, contact DEQ Help Desk 444-1840.

9. References

Guidance for Preparing a Standard Operating Procedure, WQBDMS-001, Rev# 00, 10/08/2003. Montana Department of Environmental Quality, Monitoring and Data Management Bureau.

Quality Management Plan, WQB QMP, Rev# 00, 10/08/03, Montana Department of Environmental Quality, Water Quality Bureau.

EPA Order 5360.1 A2, May 5, 2000, Policy and Program Requirements for the Mandatory Agency-Wide Quality System.

Attachment 1

SOP WQPBDMS-002
Administrative Checklist

2005 Water Quality Assessment Record Checklist - Administrative Review

Complete checklist for each assessment record and transfer electronic version to K:\2006 Integrated WQ Report\2006_Assess_Updates\! Deposit_Rosie

Waterbody-segment ID _____ (must be an ID already in the ADB database.)

- ❑ This datarev8.xls file is the most current water quality assessment record for the segment.
- ❑ A hardcopy of this datarev8.xls file is included in the SCD/BUD file.
- ❑ All previous listing cycle (hardcopy) assessment record sheets are retained the SCD/BUD file.

Verify that the electronic and hard copy records contain complete and valid entries of the following:

Reference Section

- ❑ Hydrologic Unit Code (HUC)
- ❑ Water Classification
- ❑ Segment length
- ❑ Assessed by (Assessor's Name)
- ❑ Final Assessment Date
- ❑ Summary of data not examined/excluded from assessment including rationale for excluding.

Sufficient Credible Data Tables

- ❑ Data Quality tables (SCD tables) are complete for each data type. Include a SCD score and summary.

Data Matrix

- ❑ All data or information nuggets come from a reference listed in the Reference Section.
- ❑ Data and information nuggets are concise, grammatically correct, and have correct units.

Summary

- ❑ Listing History summarizes the waterbody's historical listing status
- ❑ Impairments delisted demonstrate "good cause" per 40 CFR Part 130.7(b)(6)(iv)
- ❑ Summary of overall condition is concise and describes each beneficial use.

Use Impairment Documentation

- ❑ SCD/No SCD determination for each beneficial use of the waterbody class.
- ❑ Method number applied to the use or uses they assess.
- ❑ Includes appropriate test type for the use (e.g., W.O.E. only applied to ALUS, Fisheries)
- ❑ Beneficial use support decision for all uses with sufficient credible data. Include certainty.
- ❑ Impairments applied (linked) to the beneficial use they impact. Include certainty.
- ❑ Impairment sources linked to impairment. Verification indicated.

Describe this assessment record by circling letter and number:

A. No new data or change to assessment outcome. (Spelling, grammar, or details edited for clarity)

B. New data for post-1998 assessment. No changes to methods, support, impairment, or source.
   1. New data type added to datarev8.xls (e.g., 320 – Benthic macroinvertebrate surveys)

C. Assessment changes beneficial use support, impairment, or source
   1. No new data. Review of old assessment determined original *basis* was in error
   2. New data for post-1998 assessment. Changes to use support, impairment, or source.
      - ❑ Pollutant additions
      - ❑ Pollutant de-listings
      - ❑ Pollution additions
      - ❑ Pollution de-listings
   3. New (re)assessment of 1996-1998 delisted waterbody.
      - ❑ Pollutant additions
      - ❑ Pollutant de-listings
      - ❑ Pollution additions
      - ❑ Pollution de-listings
   4. New assessment of a previously unassessed waterbody.

❑ Datarev8.xls posted to K:\2006 Integrated WQ Report\2006_Assess_Updates\! Deposit_Rosie

Date: _____

Signature: _____

Attachment 2

SOP WQPBDMS-002
Technical Checklist

2005 Water Quality Assessment - Technical Review

This technical review is to be completed for a minimum of 10% of the water quality assessments completed during a reporting cycle. Technical assessment must be completed before submitting the electronic version of the assessment record sheet to the Integrated Report Coordinator. The intent of this review is to verify the consistent application of the state's water quality assessment method by both individual assessors and amongst the staff performing assessments.

Waterbody-segment ID _____
Waterbody Name_____

_____ References are consistently and appropriately coded on reference page (Y/N)?

_____ SCD tables are complete and the scoring appears reasonable for the dataset (Y/N)?

_____ Data Matrix is completed with *coherent* information summaries for each data type shown to be available in the reference section (Y/N)?

_____ All secondary data analyses (e.g., statistical tests) performed on data is documented and included in the assessment record. The data analyses are appropriate for the decision they support (Y/N)?

_____ When narrative standards are applied, is sufficient detail of reference source provided (Y/N)?

_____ Is the listing history and summary table complete (Y/N)?

_____ Is the Use Impairment table complete and test types appropriate for the use (e.g. WOE wrong test type for drinking water) – Y/N?

_____ Is the ***beneficial use*** to ***impairment*** to ***source*** linkage reasonable and in agreement with the description provided on the summary page (Y/N)?

Review comments (from any "no" answers above):

_____

_____

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_____

_____

_____

Signature: _____ Date: _____